REMARKS

The Official Action dated January 16, 2004 has been received and its contents carefully noted. In view thereof, claim 16 has been cancelled and claims 1 and 17 have been amended in order to better define that which Applicant regards as the invention. Accordingly, claims 1 -4, 6 and 17 are presently pending in the instant application.

With reference initially to paragraph 12 of the Office Action, claims 3, 4 and 6 have been indicated as being allowable over the prior art of record. In this regard, it is respectfully requested that these claims again be indicated as being allowable over the prior art of record in response to the present amendment.

With reference to paragraph 1 of the Office Action, claim 1 has been objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. Specifically, the Examiner is of the position that the phrase "a breakdown ratio of the capacitance insulating film is essentially 0 during plasma etching for forming the contact holes" is not supported by the specification as originally filed. Accordingly, the Examiner considers this subject matter to be new matter. As can be seen from the foregoing amendments, independent claim 1 has been amended in order to delete the phrase "during plasma etching for forming the contact holes." Accordingly, it is respectfully submitted that Applicant's claimed invention as set forth in independent claim 1 is now fully supported by the specification.

With reference to paragraph 3 of the Office Action, claims 1 and 2 have been rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically, the Examiner states that on page 20 of the instant application, Applicant defines the quantity "L" in the ratio, S/L as the sum of the widths, w, "of the lead conductive films in the boundary line between the active region and the isolating region." However, the Examiner notes that independent claim 1 recites a "total sum of widths of the lead conductive films in the boundary portion." the Examiner goes on to state that in both cases there is no recitation of how to determine "width" within a distance at the boundary. Further in claim 2, Applicant is reciting a value for, S/L, based upon the definition of L in the specification as the sum of widths determined in the boundary region. In this regard, the Examiner is of the position that

the lack of clarity would make it extremely difficult for one skilled in the art to practice and use the invention, because of the ambiguity in the recitation.

As can be seen from the foregoing amendments, claim 1 has been amended in order to clarify the particular matter sought to be patented. Particularly, independent claim 1 has been amended to recite that the ratio (S/L) of a total sum of exposed areas S of the electrode pad in the contact holes, with respect to a total sum of lengths L of the boundary line in an overlapping portion of the boundary line, between the active region and the isolating region, with the lead conductive films, is adjusted such that a breakdown ratio of the capacitance insulating film is substantially 0. Accordingly, in that this feature is clearly supported by Applicant's specification in that (W) denotes the length L in Figure 2A, it is respectfully submitted that with the foregoing amendments, independent claim 1 as well as claim 2 are now in proper formal condition for allowance.

Referring now to paragraphs 5-8 of the Official Action, claims 1, 16 and 17 have been rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,691,556 issued to Saito et al. This rejection is respectfully traversed in that the patent to Saito et al. neither discloses nor remotely suggest that which is presently set forth by Applicant's claimed invention.

With respect to independent claim 1, with the foregoing amendments, it is respectfully submitted that Saito et al. fails to disclose that a ratio (S/L) of a total sum of exposed areas S (the region 14 on the upper electrode 21) of the electrode pad in the contact holes, with respect to a total sum of lengths L of the boundary line in the overlapping portion of the boundary line, between the active region and the isolating region, with the lead conductive film, is adjusted such that a breakdown ratio of the capacitance insulating film is substantially 0. More particularly, the capacitance insulating film of Saito et al. is not adjusted such that a breakdown ratio thereof is substantially 0. Hence, the present invention as set forth in independent claim 1 as amended is clearly not anticipated by the teachings of Saito et al.

It is further noted in rejecting Applicant's claimed invention that the Examiner appears not to appreciate or give patentable significance to the feature of the present invention stating "a breakdown ratio of the capacitance insulating film is substantially 0." However, with the foregoing amendments and the amendments which overcome the new matter rejection, it is respectfully submitted that this feature is clearly not shown nor

suggested by the prior art of record and sets forth limitations which clearly distinguish Applicant's claimed invention over the prior art of record. Therefore, it is respectfully submitted that independent claim 1 as amended clearly distinguishes over the teachings of Saito et al.

With reference to paragraph 7 of the Office Action, as can be seen from the foregoing amendments, claim 16 has been cancelled in its entirety without prejudice nor disclaimer of the subject matter set forth therein. Accordingly, further discussion with respect to this rejection is no longer believed to be warranted.

With respect to paragraph 8 of the Office Action, as can be seen from the foregoing amendments , claim 17 recites a structure wherein the semiconductor substrate includes an active region and an isolation region having a shallow trench isolation structure formed so as to enclose the active region and to bury an oxide film after forming a shallow groove in the semiconductor substrate and the capacitance insulating film has a larger thickness in the boundary portion and in other portions so as to avoid generating breakdown of the capacitance insulating film. This being particularly set forth in Figure 4. Furthermore, the description on page 20, line 25 disclose that the isolating region 14 in Figure 2 is formed by a STI method, which is the same as the isolating region of Figure 4. Thus, the isolating region of Figure 4 has the STI structure.

The isolating region formed by the STI method has an advantage of forming an integrated circuit having high density and fine dimensions as compared to the isolating region formed by a LOCOS method. However, since the isolated region is formed by burying the oxide electrode in the groove having vertical sidewalls with respect to the substrate as illustrated by reference numeral 14 of Figure 4, the breakdown of the capacitance insulating film easily occurs in the boundary portion due to stress of the buried oxide film. According to the present invention, in the STI structure of the isolating region, the capacitance insulating film has a larger thickness in the boundary portion than in other portions so as to avoid generating breakdown of the capacitance insulating film.

As the Examiner can readily appreciate, Saito et al. fails to disclose that the capacitance includes an isolating region having the shallow trench isolating structure and that the capacitance insulating film has a larger thickness in the boundary portion between the active region and the isolating region than in other portions. While Saito et al. discloses that

an associated capacitance insulating film has a thickness in the boundary portion of the LOCOS insulating region, this reference clearly fails to disclose adjusting the thickness of the boundary portion so as to avoid generating breakdown of the capacitance insulating film. Thus, the capacitance of Saito et al. is not formed to avoid generating breakdown of the capacitance insulating film as is the case with Applicant's claimed invention. Accordingly, it is respectfully submitted that claim 17 likewise clearly distinguishes over the teachings of Saito et al. and is in proper condition for allowance.

Referring now to paragraph 10 of the Office Action, claim 2 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al., as applied to claims 1, 16 and 17. Again, this rejection is likewise respectfully traversed in that the patent to Saito et al. fails to disclose or suggest that which is presently set forth by Applicant's claimed invention.

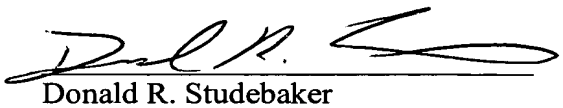
As the Examiner readily appreciates, the patent to Saito et al. fails to disclose that the ratio S/L is 4 or less than 4. Moreover, as described from page 4, line 27 to page 5, line 3 of the specification, to one of ordinary skill in the art at the time the invention was made, the breakdown of the capacitance insulating film was expected to be suppressed due to the antenna ration (ratio of the total sum (S) of the exposed areas of the electrode pad in the contact holes to the area of the upper electrode), and reduction of the breakdown ratio of the capacitance insulating film through the measurements shown from page 17, line 14 to page 19, line 8 of the specification would not even be attempted. Consequently, the feature of claim 2 would not have been obvious to one of ordinary skill in the art as suggested by the Examiner.

Furthermore, claim 2 is dependent upon independent claim 1 and includes all the limitations thereof. Accordingly, for the reasons discussed here and above with respect to independent claim 1, it is respectfully submitted that claim 2 is likewise believed to in proper condition for allowance.

Therefore, in view of the foregoing, it is respectfully requested that the objections and rejections of record be reconsidered and withdrawn by the Examiner, that claims 1-4, 6 and 17 be allowed and that the application be passed to issue.

Should the Examiner believe a conference would be of benefit in expediting the prosecution of the instant application, he is hereby invited to telephone counsel to arrange such a conference.

Respectfully submitted,



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